

FORM-PTO-1390  
(Rev. 10-96)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

027650-836

U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5)

Unassigned 09/423207

TRANSMITTAL LETTER TO THE UNITED STATES  
DESIGNATED/ELECTED OFFICE (DO/EO/US)  
CONCERNING A FILING UNDER 35 U.S.C. 371INTERNATIONAL APPLICATION NO.  
PCT/SE98/00970INTERNATIONAL FILING DATE  
22 May 1998 (22.05.98)PRIORITY DATE CLAIMED  
29 May 1997 (29.05.97)

## TITLE OF INVENTION

AN EXTRUDED/BLOW MOULDED BOTTLE, AS WELL AS A METHOD AND MATERIAL FOR PRODUCING THE BOTTLE

## APPLICANT(S) FOR DO/EO/US

ANDERSSON, Thorbjorn; ANDREN, Sven; BENTMAR, Mats; DALHOLM, Patrik; OVEBY, Claes; WALLEN, Goran

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

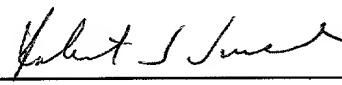
1.  This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2.  This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3.  This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and the PCT Articles 22 and 39(1).
4.  A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
- A copy of the International Application as filed (35 U.S.C. 371(c)(2))
  - a.  is transmitted herewith (required only if not transmitted by the International Bureau).
  - b.  has been transmitted by the International Bureau.
  - c.  is not required, as the application was filed in the United States Receiving Office (RO/US)
- A translation of the International Application into English (35 U.S.C. 371(c)(2)).
- Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
  - a.  are transmitted herewith (required only if not transmitted by the International Bureau).
  - b.  have been transmitted by the International Bureau.
  - c.  have not been made; however, the time limit for making such amendments has NOT expired.
  - d.  have not been made and will not be made.
- A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
- An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
- A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

## Items 11. to 16. below concern other document(s) or information included:

11.  An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
12.  An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13.  A **FIRST** preliminary amendment.
- A **SECOND** or **SUBSEQUENT** preliminary amendment.
14.  A substitute specification.
15.  A change of power of attorney and/or address letter.
16.  Other items or information:

Publ. No. WO 98/53986; PCT Forms ISA/210, IPEA/401, IPEA/408; letter dated July 6, 1999 enclosing set of claims amended in response to Written Opinion dated May 28, 1999.



U.S. APPLICATION NO. (if known, see 37 CFR 1.450) Unassigned	INTERNATIONAL APPLICATION NO. PCT/SE98/00970	ATTORNEY'S DOCKET NUMBER 027650-836
17. <input checked="" type="checkbox"/> The following fees are submitted:		CALCULATIONS
<b>Basic National Fee (37 CFR 1.492(a)(1)-(5)):</b> Search Report has been prepared by the EPO or JPO ..... \$840.00 (970) International preliminary examination fee paid to USPTO (37 CFR 1.482) ..... \$670.00 (956) No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) ..... \$760.00 (958) Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO ..... \$970.00 (960) International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4) ..... \$96.00 (962)		
<b>ENTER APPROPRIATE BASIC FEE AMOUNT =</b>		\$ 970.00
Surcharge of \$130.00 (154) for furnishing the oath or declaration later than 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).		\$
Claims	Number Filed	Number Extra
Total Claims	4 -20 =	X \$18.00 (966)
Independent Claims	1 -3 =	X \$78.00 (964)
Multiple dependent claim(s) (if applicable)		+\$260.00 (968)
<b>TOTAL OF ABOVE CALCULATIONS =</b>		\$ 970.00
Reduction for 1/2 for filing by small entity, if applicable. Verified Small Entity statement must also be filed. (Note 37 CFR 1.9, 1.27, 1.28).		\$
<b>SUBTOTAL =</b>		\$ 970.00
Processing fee of \$130.00 (156) for furnishing the English translation later than 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)). +		\$
<b>TOTAL NATIONAL FEE =</b>		\$ 970.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). per property +		\$ 40.00
<b>TOTAL FEES ENCLOSED =</b>		\$ 1010.00
Amount to be: refunded		\$
charged		\$
a. <input checked="" type="checkbox"/> A check in the amount of \$ <u>1010.00</u> to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. <u>02-4800</u> in the amount of \$ _____ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. <u>02-4800</u> . A duplicate copy of this sheet is enclosed.		
NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.		
SEND ALL CORRESPONDENCE TO:		
Robert S. Swecker BURNS, DOANE, SWECKER & MATHIS, L.L.P. P.O. Box 1404 Alexandria, Virginia 22313-1404		
 SIGNATURE		
Robert S. Swecker NAME		
19,885 REGISTRATION NUMBER		
Date: November 3, 1999		

09/423207

423 PCT/PTO 03 NOV 1999

PATENT  
Attorney Docket 027650-836

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application Of

THORBJORN ANDERSSON, et al. : Group Art Unit: Unassigned

Serial No. UNASSIGNED :

Filed: November 3, 1999 :

For: AN EXTRUDED/BLOW MOULDED  
BOTTLE, AS WELL AS A METHOD  
AND MATERIAL FOR PRODUCING  
THE BOTTLE :

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE CLAIMS:

Claim 3, line 1, delete "any of claims 1 and 2", and insert --claim 1--.

Claim 4, line 1, delete "any of claims 1-3", and insert --claim 1--.

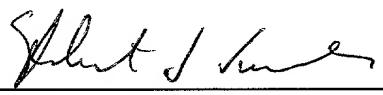
REMARKS

The above amendments have been made to remove the multiple dependencies in the claims. Early and favorable action in connection with this application is respectfully requested.

Respectfully submitted,

BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By

  
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Date: November 3, 1999

AN EXTRUDED/BLOW MOULDED BOTTLE, AS WELL AS A METHOD  
AND MATERIAL FOR PRODUCING THE BOTTLE

**TECHNICAL FIELD**

5 The present invention relates to a bottle or similar container which is produced by a combined extrusion/blow moulding process. The present invention also relates to an extrusion/blow moulding process, together with a granulate starting material for the production of said bottle or similar container.

10

**BACKGROUND ART**

Bottles and similar containers of plastic are conventionally produced by a combined extrusion/blow moulding process in which granulate starting material of plastic is fed into a screw/cylinder apparatus together 15 with other additives selected for the container production process. By means of the rotating screw fitted with helical blade, the starting material is advanced through the cylinder at the same time as it is melted and the above-mentioned additives are distributed and thoroughly mixed throughout the entire molten plastic mass. The molten, homogeneous plastic 20 mass is pressed through a tool (nozzle) which is disposed at the front end of the apparatus and is provided with an annular aperture for forming a tube or hose. The extruded hose is inserted into and accommodated by a mould cavity formed by moving mould halves, whereafter the hose end thus accommodated between the mould halves is cut and inflated to the inner 25 walls of the mould cavity by means of a blowpipe which is inserted in the hose and is in valve-regulated communication with a source of high pressure air. The compressed air communication is broken and the mould halves are separated from one another for removing the extruded/blow moulded 30 container whose geometric outer configuration exactly corresponds with the configuration defined by the inner walls of the mould cavity.

In the above-described method, for example bottles of high density polyethylene (HDPE) are produced for milk and similar liquid foods. With the aid of modern, high speed filling machines, the freshly produced, empty bottles are filled with the pertinent contents, whereafter the filled bottles are 35 sealed by means of a suitable sealing agent or capsule device which is applied in liquid-tight fashion on the bottle over the open bottle neck. Filled

bottles discharged from the filling machine are thereafter collected in stacks or groups suitable for distribution, for further transport out to a sale or consumption point for the packed product.

5 While the handling of the filled bottles takes place by machine as far as this is at all possible, there nevertheless occur occasions when the bottles or bottle groups must be handled manually as in, for example, certain reloading and relocation operations.

A serious drawback inherent in the prior art extruded/blow moulded bottles of high density polyethylene (HDPE) is that they are excessively, but 10 of necessity, relatively thick-walled and therefore unnecessarily heavy and unwieldy to handle manually. The relatively large wall thickness is, on the other hand, necessary in order that the requisite mechanical strength and rigidity be imparted to the bottle, and such mechanical strength and rigidity deteriorates dramatically and becomes insufficient if the wall thickness of the 15 bottle is less than a minimum value which, at least to some extent, is determined by the relevant bottle shape. In addition to its excessive, but necessary wall thickness, the prior art extruded/blow moulded bottle consumes an unnecessary amount of material and is, therefore, costly in production.

20

#### OBJECTS OF THE INVENTION

One object of the present invention is thus to obviate the above-described drawbacks inherent in the prior art technology.

25 A further object of the present invention is to realise an extruded/blow moulded bottle of plastic with greatly reduced material weight, but maintained desired superior mechanical strength and rigidity in order to be able to be handled easily and conveniently.

These and other objects and advantages will be attained according to 30 the present invention as a result of the extruded/blow moulded bottle as defined in independent Claim 1.

Further expedient embodiments of the bottle according to the present invention have moreover been given the characterizing features as set forth in appended subclaims 2 to 6.

35 A further object of the present invention is to realise a combined extrusion/blow moulding operation for producing such weight-reduced, mechanically strong and rigid plastic bottles. This object has been attained

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according to the present invention by means of the process as defined in independent Claim 7. Expedient embodiments of the process according to the present invention have further been given the characterizing features as set forth in appended subclaims 8 to 11.

5 Yet a further object of the present invention is to realise a suitable starting material of plastic for producing the extruded/blow moulded bottle. This object is attained according to the present invention by means of the granulate plastic material as defined in independent Claim 12.

## 10 OUTLINE OF THE INVENTION

The material in the foamed intermediate layer in the extruded/blow moulded plastic bottle should thus consist of a mixture of a first rigid polymer component and a second, soft (ductile) polymer component, of which the first, rigid component forms the skeleton or interstices in the 15 foamed wall layer structure, while the second, soft (ductile) polymer component forms a skin or cell wall between the above-mentioned skeleton or interstices, respectively. Preferably, the rigid and ductile (soft) polymer components are of the same polymer type.

20 Examples of such rigid polymer components which have proved to be usable in the foamed intermediate layer material in the extruded/blow moulded plastic bottle according to the present invention may be high density polyethylene (HDPE), high melt-strength polypropylene (HMS PP), etc., while examples of such ductile (soft) polymer components which have proved to be usable in the foamed intermediate layer material may be low 25 density polyethylene (LDPE), polypropylene for general purposes (GP PP), etc.

A particularly preferred combination of rigid polymer component and ductile (soft) polymer component is, according to the present invention, 30 low density polyethylene (LDPE) and high density polyethylene (HDPE) in which the mixing ratio of LDPE to HDPE is 1:3-3:1 based on weight. Optimum results concerning the weight and rigidity in the extruded/blow moulded plastic bottle according to the invention are achieved when the mixing ratio of LDPE to HDPE is 1.5:1.

35 The rigid, skeleton-forming polymer component in the foamed intermediate layer in the extruded/blow moulded plastic bottle according to the present invention may also be defined as a polymer component which

has a high crystallisation degree (high crystalline), high density, few short chain branches per 1000 C atoms and no long chain branches at all. Correspondingly, the ductile (soft) polymer component may be defined as a polymer component which has low crystallisation degree (low crystalline),  
5 low density, many short chain branches per 1000 C atoms and also long chain branches. Concerning the rigid polymer component of HDPE, this implies a density in the range of 950-970 and a melt index in the range of 0.5-1.5, while, for the ductile (soft) polymer component of LDPE, this implies a density in the range of 915-922 and a melt index in the range of 4.5-8.5.  
10 The chemical blowing agent with which the mixture of the rigid and ductile (soft) polymer components is to be expanded or foamed may, according to the present invention, be sodium hydrocarbonate and/or citric acid, preferably a mixture of these two blowing agents in stoichiometric proportions. The total quantity of blowing agent which is employed in the  
15 production of an extruded/blow moulded plastic bottle by the method according to the present invention may vary from approx. 0.5 to approx. 2.5% of the total weight of the mixture.

#### BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWING

20 The present invention will now be described in greater detail hereinbelow with the aid of a preferred but non-restrictive Example and with reference to the accompanying Drawing which schematically illustrates a cross section of a wall material of an extruded/blow moulded plastic bottle according to the present invention.

25

#### DESCRIPTION OF PREFERRED EMBODIMENT

According to the preferred embodiment which is shown schematically on the accompanying Drawing, the wall material carrying the generic reference numeral 10 comprises, in an extruded/blow moulded plastic  
30 bottle, a central layer 11 and two outer skin layers 12 and 13 on both sides of the central layer 11.

The material in the central, foamed layer 11 consists, as was mentioned above, of a mixture of a first rigid polymer component and a second ductile (soft) polymer component which, in the relevant embodiment, is an HDPE component and an LDPE component, respectively, of which the HDPE component has a density in the range of 950-970 and a

melt index in the range of 0.1-1.5, while, correspondingly, the LDPE component has a density in the range of 915-922 and a melt index in the range of 4.5-8.5. The mixing ratio between the two polymer components (i.e. LDPE:HDPE) should be between 1:3 and 3:1, preferably 1.5:1, in order to 5 give optimum results as regards rigidity/thickness of the produced plastic bottle.

The two outer wall layers 12 and 13 may be the same or different, but are preferably the same and produced from a polymer possessing a high modulus of elasticity, for example HDPE, whereby high strength and 10 rigidity will be attained as a result of the so-called I-beam effect, as will be well-known to a person skilled in the art.

The relative thicknesses of the central, foamed wall layer 11 and the two outer homogeneous wall layers 12 and 13 are preferably such that the central, foamed wall layers 11 takes up approx. 50-100% of the total weight 15 of the wall material, while the two outer, homogeneous layers 12 and 13 together constitute approx. 0-50% of the total weight of the wall material.

A bottle for packing and transporting liquid foods, for example milk, for refrigerated distribution is produced according to the present invention by means of a combined (co-)extrusion/blow moulding process comprising 20 a first (co-)extrusion step and a subsequent, second blow moulding step.

Granulate starting material containing, i) a first rigid polymer component, preferably HDPE, ii) a second ductile (soft) polymer component (LDPE) and iii) a chemical blowing agent, preferably sodium hydrocarbonate and/or citric acid, is fed into a screw/cylinder apparatus through a 25 replenishment hopper disposed at the rear end of the apparatus. The ratio between the components included in the granulate starting material is such that the ratio of the ductile (soft) LDPE component to the rigid HDPE component lies within the range of 1:3-3:1, preferably 1.25:1. The quantity of the chemical blowing agent should be 0.5-2.5% of the total weight of the 30 granulate starting material. The infed granulate starting material is subjected to high temperature in an infeed zone of the screw/cylinder apparatus in which the free area between the walls of the cylinder and the screw core is minimised in order to create superior mixing conditions for the infed components in the starting material and, at the same time as the starting 35 material is heated to such an elevated temperature that the chemical blowing agent (sodium hydrocarbonate and citric acid) is decomposed for the

formation of carbon dioxide and sodium hydrocarbonate and citric acid residues acting as nucleation seats in the molten plastic mass.

5 The molten, homogeneously mixed plastic starting material is advanced by the rotating screw fitted with helical blades from the infeed zone to a further compression zone, at the same time as the starting material is cooled for the formation of a cool homogeneous mixture under a pressure of between 200 and 300 bar excess pressure. At this high pressure, the released carbon dioxide is converted into overcritical state.

10 The cooled, pressurised plastic melt is thereafter forced out through a tool (nozzle) which is disposed at the front end of the screw/cylinder apparatus and is provided with an annular nozzle aperture, for the formation of a hose at the same time as the overcritical carbon dioxide instantaneously expands at the pressure transition from the above-mentioned excess pressure of 200-300 bar to normal atmospheric pressure, 15 for the formation of the foamed wall layer structure.

15 The extruded, foamed hose of LDPE/HDPE is introduced into the region between two movable mould halves which are brought together for the formation of a mould cavity in which the hose is accommodated. The hose accommodated in the mould cavity is cut and the two mould halves are 20 transferred to a mould blowing station in which the hose portion accommodated between the mould halves is inflated, by means of a blowpipe inserted into the hose, towards the inner walls in the mould cavity defined by the mould halves. Thereafter, the mould halves are separated from one another for removing (or stripping) the blow moulded bottle 25 whose geometric outer configuration thus substantially corresponds to the inner mould cavity configuration.

20 In an alternative embodiment, the above-mentioned screw/cylinder apparatus may be supplemented with at least one additional screw/cylinder apparatus connected to the same common tool for co-extrusion of solid (dense) outer layers 12 and 13, as shown on the Drawing. Such a wall structure affords an extremely high mechanical strength and rigidity at very 30 low material consumption seen as a whole.

35 In the above-described method according to the present invention, extruded/blow moulded plastic bottles may be produced with a nominal inner volume of 1l. with the same or comparable rigidity and strength as a

conventional bottle produced from HDPE, but with up to 30% less material consumption.

The present invention should not be considered as restricted to that described above and shown on the Drawing, many modifications being 5 conceivable without departing from the scope of the appended Claims.

07 -07- 1999

## Replacement sheet

## Claims

1. An extruded/blow moulded bottle having an extruded wall structure (10) comprising an intermediate layer (11) of foamed plastic and outer, solid layers (12 and 13) of plastic, **characterized in that** the plastic of the foamed intermediate layer (11) is a mixture of a first, rigid polymer component being selected from the group essentially comprising high density polyethylene and high melt-strength polypropylene, and a second ductile (soft) polymer component being selected from the group essentially comprising low density polyethylene and polypropylene for general purposes, that said plastic of the outer, solid layers (12 and 13) is of the same type as said rigid polymer component of the foamed intermediate layer (11), and in that all layers (11,12,13) are produced through a coextrusion process.

10 2. The extruded/blow moulded bottle as claimed in claim 1, **characterized in that** the mixing ratio of the first, rigid polymer component to the second, ductile (soft) polymer component in the foamed plastic layer (11) is between 1:3 and 3:1.

15 3. The extruded/blow moulded bottle as claimed in any of claims 1 and 2, **characterized in that** the central, foamed plastic layer (11) takes up between 50 and 100% of the total weight of the wall material, while the two outer, surrounding plastic layers (12 and 13) together take up between 0 and 50% of the total weight of the wall material.

20 4. The extruded/blow moulded bottle as claimed in any of claims 1-3, **characterized in that** the two outer, surrounding layers (12 and 13) display substantially the same layer thicknesses.

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY  
(Includes Reference to Provisional and PCT International Applications)

ATTORNEY'S DOCKET NUMBER

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name;  
I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

the specification of which (check only one item below):

is attached hereto.  
 was filed as United States application

Number \_\_\_\_\_  
on \_\_\_\_\_  
and was amended  
on \_\_\_\_\_ (if applicable).

was filed as PCT international application

Number PCT/SE98/00970  
on 22 May 1998 (22.05.98)

and was amended under PCT Article 19  
on \_\_\_\_\_ (if applicable).

2000-04-16 09:00:00

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, §119 (a)-(e) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed:

## PRIOR FOREIGN/PCT APPLICATION(S) AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. §119:

COUNTRY (if PCT, indicate "PCT")	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 35 U.S.C. §119
Sweden	9702026-7	29 May 1997 (29.05.97)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under Title 35, United States Code § 119(e) of any United States provisional application(s) listed below.

(Application Number) \_\_\_\_\_

(Filing Date) \_\_\_\_\_

(Application Number) \_\_\_\_\_

(Filing Date) \_\_\_\_\_

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED)  
(Includes Reference to Provisional and PCT International Applications)

ATTORNEY'S DOCKET NO.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States applications(s) or PCT international application(s) designating the United States of America that is/are listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose to the Office all information known to me to be material to the patentability as defined in Title 37, Code of Federal Regulations §1.56, which became available between the filing date of the prior application(s) and the national or PCT international filing date of this application:

PRIOR U.S. APPLICATIONS OR PCT INTERNATIONAL APPLICATIONS DESIGNATING THE U.S. FOR BENEFIT UNDER 35 U.S.C. 120:

U.S. APPLICATIONS		STATUS (check one)		
U.S. APPLICATION NUMBER	U.S. FILING DATE	PATENTED	PENDING	ABANDONED
PCT APPLICATIONS DESIGNATING THE U.S.				
PCT APPLICATION NO.	PCT FILING DATE	U.S. APPLICATION NOS. ASSIGNED (if any)		
PCT/SE98/00970	22.05.98	Unassigned	X	

I hereby appoint the following attorneys and agent(s) to prosecute said application and to transact all business in the Patent and Trademark Office connected therewith and to file, prosecute and to transact all business in connection with international applications directed to said invention:

William L. Mathis	<u>17,337</u>	Samuel C. Miller, III	<u>27,360</u>	Robert M. Schulman	<u>31,196</u>
Peter H. Smolka	<u>15,913</u>	Ralph L. Freeland, Jr.	<u>16,110</u>	William C. Rowland	<u>30,888</u>
Robert S. Swecker	<u>19,885</u>	Robert G. Mukai	<u>28,531</u>	T. Gene Dillahunty	<u>25,423</u>
Platon N. Mandros	<u>22,124</u>	George A. Hovanec, Jr.	<u>28,223</u>	Patrick C. Keane	<u>32,858</u>
Benton S. Duffett, Jr.	<u>22,030</u>	James A. LaBarre	<u>28,632</u>	Bruce J. Boggs, Jr.	<u>32,344</u>
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Norman H. Stepno	<u>22,716</u>	R. Danny Huntington	<u>27,903</u>	Peter K. Skiff	<u>31,917</u>
Ronald L. Grudziecki	<u>24,970</u>	Eric H. Weisblatt	<u>30,505</u>	Richard J. McGrath	<u>29,195</u>
Frederick G. Michaud, Jr.	<u>26,003</u>	James W. Peterson	<u>26,057</u>	Matthew L. Schneider	<u>32,814</u>
Alan E. Kopecki	<u>25,813</u>	Teresa Stanek Rea	<u>30,427</u>	Michael G. Savage	<u>32,596</u>
Regis E. Slutter	<u>26,999</u>	Robert E. Krebs	<u>25,885</u>	Gerald F. Swiss	<u>30,113</u>

and: \_\_\_\_\_

Address all correspondence to:

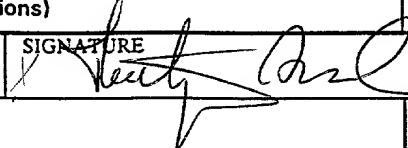
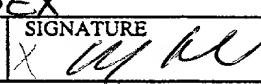
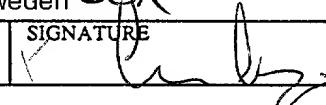
BURNS, DOANE, SWECKER & MATHIS, L.L.P.  
P.O. Box 1404  
Alexandria, Virginia 22313-1404

Address all telephone calls to: \_\_\_\_\_ at (703) 836-6620.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

COMBINED DECLARATION FOR PATENT APPLICATION AND POWER OF ATTORNEY (CONTINUED)  
(Includes Reference to Provisional and PCT International Applications)

ATTORNEY'S DOCKET NO.

FULL NAME OF SOLE OR FIRST INVENTOR <u>Andersson, Thorbjörn</u>		SIGNATURE 	DATE 19/10-1999
RESIDENCE Sweden		CITIZENSHIP Sweden	
POST OFFICE ADDRESS Assarhusavägen 56, S-240 17 S:a Sandby, Sweden <b>SEX</b>			
FULL NAME OF SECOND JOINT INVENTOR, IF ANY <u>Andrén, Sven</u>		SIGNATURE 	DATE 19/10-1999
RESIDENCE Sweden		CITIZENSHIP Sweden	
POST OFFICE ADDRESS Älgskyttevägen 19, S-226 53 Lund, Sweden <b>SEX</b>			
FULL NAME OF THIRD JOINT INVENTOR, IF ANY <u>Bentmar, Mats</u>		SIGNATURE 	DATE 19/10-1999
RESIDENCE Sweden		CITIZENSHIP Sweden	
POST OFFICE ADDRESS Hästhovsgatan 8, S-233 37 Svedala, Sweden <b>SEX</b>			
FULL NAME OF FOURTH JOINT INVENTOR, IF ANY <u>Dalholm, Patrik</u>		SIGNATURE 	DATE 19/10-1999
RESIDENCE Sweden		CITIZENSHIP Sweden	
POST OFFICE ADDRESS Styrbjörn Starkes g ränd 6, S-224 77 Lund, Sweden <b>SEX</b>			
FULL NAME OF FIFTH JOINT INVENTOR, IF ANY <u>Uveby, Claes</u>		SIGNATURE 	DATE 19/10-1999
RESIDENCE Sweden		CITIZENSHIP Sweden	
POST OFFICE ADDRESS Nils Anders väg 27, S-232 51 Åkarp, Sweden <b>SEX</b>			
FULL NAME OF SIXTH JOINT INVENTOR, IF ANY <u>Wallén, Göran</u>		SIGNATURE 	DATE 19/10-1999
RESIDENCE Sweden		CITIZENSHIP Sweden	
POST OFFICE ADDRESS Stationsgatan 13, S-244 63 Kävlinge, Sweden <b>SEX</b>			
FULL NAME OF SEVENTH JOINT INVENTOR, IF ANY		SIGNATURE	DATE
RESIDENCE		CITIZENSHIP	
POST OFFICE ADDRESS			
FULL NAME OF EIGHTH JOINT INVENTOR, IF ANY		SIGNATURE	DATE
RESIDENCE		CITIZENSHIP	
POST OFFICE ADDRESS			
FULL NAME OF NINTH JOINT INVENTOR, IF ANY		SIGNATURE	DATE
RESIDENCE		CITIZENSHIP	
POST OFFICE ADDRESS			

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